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ABSTRACT

This study compared two methods of providing individualized feedback on written assignments. Eighty-one students were randomly assigned to one of the two treatment groups--audiotape feedback or written feedback--for a one semester university course. The amount of faculty time required for implementation, the effects of such feedback on student achievement, and the reaction of students to each type of feedback were compared. Findings indicate that: (1) the students who received the audio feedback were more pleased with it than were those who received the written feedback; (2) slightly less time was required to provide audio feedback than written feedback; and (3) there was no difference in student achievement as determined by the first grade in the course according to the type of feedback received. (DAG)

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# Individualizing Instructional Feedback: A Comparison of Feedback Modes in University Classes

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The term "individualized instruction" means many things to many people. To some the term brings vision of Audio-Tutorial systems. Others think of students sitting at computer terminals interacting with the computer. Programmed texts and student learning activity packets may be thought of by others. A one to one student-teacher relationship is considered to be individualized instruction by many. It is easy to see that a variety of activities can be classified as individualized instruction.

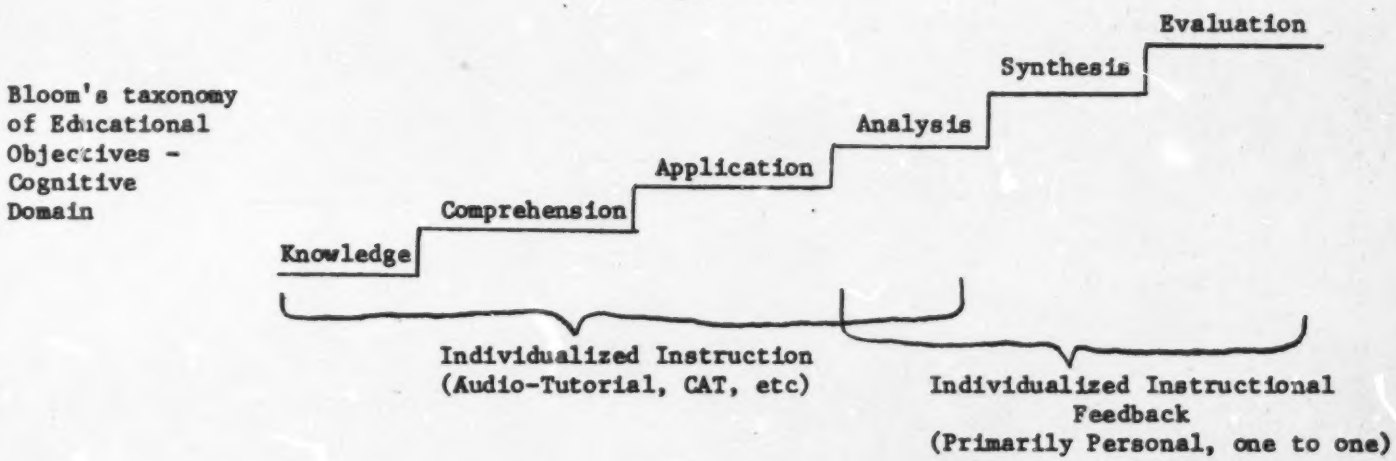
Even though the procedures may differ the primary goal of most individualized instruction systems is the initial acquisition of knowledge. If we were to examine the learning that occurs in present individualized systems (primarily audio-tutorial and computer assisted instruction) in relation to Bloom's Taxonomy of Educational Objectives,(1974) most, but certainly not all of the learning that occurs, would be classified in the lower levels of the cognitive domain - acquisition and comprehension of concepts and facts. The higher order cognitive learning, particularly at the synthesis level is often difficult to incorporate into audio-tutorial and computerized instructional systems since this level of learning is characterized by putting together elements and parts in such a way as to constitute a pattern or structure not clearly there before. Examples of such activities are architectural drawings, marketing and distribution plans, lesson plans and curriculum designs, public relation and advertising campaigns, chemical formulations, metallurgy, essays, themes, research papers, poems, blueprints, scripts, etc.

If individualized instruction is desirable for students who are learning the basic concepts it appears individualized attention would be even more important for students performing at the higher cognitive levels.

Individualized instruction at these levels is often in the form of feedback concerning the adequacy of the students' application and synthesis of knowledge learned through individualized instruction systems such as compupterized or audio-tutorial instruction.

This concept is depicted in the following Figure:

Figure 1




## The Need for Individualized Feedback

Various researchers have examined the use of individualizing feedback to promote learning. Page (1958) in an experimental study involving 74 high school teachers and 2,139 students found that students had significantly better grades on their assignments when their teachers wrote extensive comments on their work as compared to students who received only a grade or a few written comments on their work.

Lesner (1967) found that elementary students (N=965) who received written teacher comments on corrected spelling tests showed significantly more gains on subsequent spelling tests than those who had not received

any comments.

After reviewing twelve studies (Allen, 1972; Hake, 1973; Hammer, 1972; Klinger, 1971; Lesner, 1967; Mapel, 1970; Moody, 1970; Rhoads, 1967; Shrago, 1970; Simons, 1971; Starky, 1971; Sweet, 1966) that were designed partially to replicate Page's original study Stewart and White (19.6, p. 4981) concluded, "The most consistent evidence for comment effectiveness is found at the college level." Stewart and White go on to say, "In cases where comments were effective, they were encouraging and personalized in nature."

In view of the research findings which indicate students benefit from individualized feedback it appears more of this type of feedback should be used. However, providing individualized feedback does present problems.

## Problems in Providing Individualized Feedback

Providing individualized feedback requires time. Stewart and White (1976, p 499) write, "...while comments may have some positive effect ... the size of this effect may actually be quite small, especially when one considers the amount of time which a teacher would expend to write comments on papers in the personalized manner which seems to be most effective."

The university professor today is beset with conflicting demands for his time. His students expect good teaching, personal consultation and careful examination and evaluation of their work. The university expects the professor to conduct research, write journal articles, and engage in other scholarly activities. All of these activities are time consuming.

Wise use of faculty time is a matter that is becoming increasingly more important. Weldy (1974) implies that educators may not be using time

properly by writing, "Leaders in business and industry have become more concerned about ... use of time that have educational administrators."

Teaching classes, advising students, conducting research, and evaluating students' work requires considerable amounts of time. Several studies (Keene, 1971; University of Minnesota, 1970; University of Michigan, 1970; Clark, 1968; Gerstl, 1959; Wiche, 1961; McElhaney, 1959) have revealed that university faculty members work 53-60 hours per week, with a high preponderance at 55-57 hours.

The amount of time required to perform the various academic duties is an area of research that has been virtually ignored. Much of the work performed by faculty members require more time than has been realized. A study by Blackburn and Trowbridge (1972) reveal that producing one PhD per year is equal to 1/3 of faculty member's workload.

Students are becoming more concerned about the amount of time spent by professors conducting research instead of working with students. An editorial in The Purdue Exponent on April 27, 1976 called for more emphasis on students and less on research. Part of the editorial reads as follows, " ... the university is designed to instruct students rather than place professors in the national spotlight for their accomplishments in the area of research."

A study comparing professors and graduate teaching associates conducted at a Big Ten university by G. Moore and B. Moore (1976) found university undergraduate students to perceive that professors did not take as much time to work with them or evaluate their work as carefully as graduate teaching associates.

In trying to save time for research activities the professor should

not jeopardize the education of his students by providing inadequate individualized feedback. Methods of providing individualized feedback are needed which will be educationally sound but will require less faculty time.

## Alternative Methods of Providing Individualized Feedback

In a presentation to the American Educational Research Association Higgins (1973) maintained that contributions to the design of effective instruction could be generated by comparing various methods of providing instructional feedback. A review of the literature on feedback reveals there are several methods of providing individualized feedback that may be effective and also utilize faculty time more effectively.

One method of providing individualized feedback that has potential is audio cassette tapes. Early in this decade Miller (1973) writing in Engineering Education suggested using audio cassette tapes in a wide variety of educational endeavors. Two years later, Hurst (1975) writing in the same journal reported that using cassettes to provide feedback to students improved student report writing. Kahrs (1974) was enthusiastic about the use of audio cassette tapes to provide feedback in college physical education classes.

Using cassette tapes to provide feedback is a simple procedure. As the professor reads a student's paper, he can speak his comments into a cassette tape recorder. Since speaking is faster and easier than writing, time should be saved while the extensiveness of the comments are increased. Cassette tape feedback could be used with a wide variety of assignments.

An added bonus of using verbal feedback on written assignments is the increase of "personal attention" a professor can give a student by speaking

directly to him, sharing his thoughts, giving encouragement along with criticism. Directional comments can be shared in more depth which may eliminate the need for further explanation before improvement can begin.

## Comparing Written Feedback With Taped Feedback

In order to determine the effectiveness, feasibility, and amount of faculty time involved in providing two methods of individualized feedback a research study was funded by the Department of Education at Purdue University. Specifically, the study compared two methods of providing individualized feedback on written assignments - the traditional written comments and audio tape recorded comments. The amount of faculty time required for implementation, the effects of such feedback on student achievement, and the reaction of students to each type of feedback was compared. The study was conducted in two phases.

## Methodology

Population Students in education classes at Purdue University were used in this study. In Phase I the classes involved were two 200 level introduction to teaching courses with 50 students and two 400 level teaching methods classes with 31 students. Phase I was conducted during the 1976-77 school year.

Design of Phase I The design of Phase I can be described as Campbell and Stanley's (1973) experimental design 6, posttest-only control group design. The design is illustrated as follows:

$$R \quad X_1 \quad O_1$$

$$R \quad X_2 \quad O_2$$

Students within each class in this study were randomly assigned to one of the two treatment groups at the start of the semester. The treatments were:

$X_1$ - Audio recorded feedback on assignments

$X_2$ - Written feedback on assignments

The students in treatment group one received audio feedback on assignments. Each student in this group was assigned a numbered cassette tape which was turned in with each written assignment. The professor recorded his comments on the tape and returned it with the assignment. Cassette tape players were available for students' use in the education workroom and the library. At the end of the semester the cassette tapes were collected for use the following semester. Students in group two received traditional written comments.

Three different dependent variables were examined. Student achievement as determined by the final grade of the students ($O_{1,2}$) was one of the dependent variables. Additionally the amount of faculty time required in providing each type of feedback was analyzed. The third dependent variable, students' attitude, was measured using a ten item Likert-type instrument developed for this study. The instrument had moderate correlation between items and an alpha reliability of .69. A five point range was used for the responses. (See Table 1 for the instrument)

## Phase I Findings

### Student Attitudes

The students who received the tape recorded feedback were more pleased with the manner in which they received feedback than were the students who received written feedback. The mean attitude score of 39 students who received taped feedback was 37.64 while the mean attitude score of 38 students who received written feedback was 33.23. This difference in attitude scores is significant at the .05 probability level using an independent sample t-test. ($t=2.20$, $dp=76$, $p=.031$).

Table 1

Students' Reaction to Type of Feedback on Assignments

| Statement | PHASE I Tape (N=39) | PHASE I Written (N=38) | PHASE II Tape N=9 | PHASE II Written N=9 |
|---|---|---|---|---|
| 1. The manner in which feedback was provided on my assignments was dumb. | 4.03[a] | 3.71 | 4.78 | 4.44 |
| 2. I would like to have more of the type of feedback I received on the assignments in other courses. | 3.56 | 3.45 | 4.56 | 3.67 * |
| 3. I had trouble understanding what needed to be improved on my assignments. | 3.18 | 3.26 | 4.78 | 3.78 * |
| 4. The feedback on the assignments was helpful. | 3.67 | 3.61 | 4.44 | 4.00 * |
| 5. Not enough feedback was provided on the assignments | 3.10 | 2.97 | 4.33 | 4.11 |
| 6. I liked the manner in which I received feedback. | 3.90 | 3.37 * | 4.67 | 3.67 * |
| 7. I could have turned in better assignments if the manner in which I received feedback had been different. | 3.67 | 3.21 * | 4.44 | 4.22 |
| 8. The manner in which I received feedback on my assignments was inconvenient. | 3.31 | 3.87 * | 4.44 | 4.44 |
| 9. I had a clear understanding of what needed to be changed in order to improve on my assignments. | 3.90 | 3.26 * | 4.33 | 3.67 * |
| 10. The manner in which I received feedback indicated that the instructor was interested in my progress. | 4.08 | 3.47 * | 4.78 | 4.22 * |
| Total Attitude Score [b] | 37.64 | 33.23 * | 45.56 | 40.33 * |

[a] The scoring was Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly Disagree = 1. However, Items 1,3,5,7, and 8 were written as negative items; therefore, the scoring of these items was reversed. A high score is desirable.

[b] Alpha reliability for this instrument is .69

* $p < .05$

An examination of the response to individual items on the instrument (see Table 1) tend to support the notion that tape recorded feedback is more personalized and provides more indepth feedback to students than does written feedback. Students who received tape recorded feedback perceived the instructor to be more interested in their progress than did the students who received written feedback (Item 10). Students who received tape recorded feedback believed they had a clearer understanding of what needed to be improved on their assignments (Item 9). Students who received written comments believed they could have turned in better assignments if the feedback method had been different (Item 7). The only drawback to taped feedback according to the students was that it was more inconvenient than written feedback (Item 8).

Faculty Time Usage

Slightly less time was required to provide tape recorded feedback. The total amount of time required to provide tape recorded feedback to 43 students was 873 minutes for an average of 20.3 minutes per student. The time required to provide written feedback to 37 students was 866 minutes for an average of 23.4 minutes per student. (See Table 2) A savings in time of about 3 minutes per student was realized by using tape recorded feedback. As the level of the class increased so did the amount of time saved by using taped feedback. In the 400 level classes a savings of ten minutes per student was realized using tape recorded feedback. No statistical analysis was performed on this data due to the variation in group sizes and variation in group assignments.

Student Achievement

There was basically no difference in student achievement as determined by final grade in the course according to type of feedback received. The mean grade average of 36 students who received tape feedback was 3.3 on a four point scale while the mean grade average for 37 students who received written feedback was 3.4. An interesting finding was that both types of feedback improved student performance on later tasks. An illustration of this is the Spring 1977 Education 440 class. Students were required to turn in a lesson plan every week. As can be seen in Figure 2 the lesson plans progressively improved regardless of the type of feedback.

Table 2

Teacher Time Required to Provide Feedback on Assignments

| | Class | Group Size | Feedback Type | Total Feedback Time in Minutes | Mean Feedback Time in Minutes |
|---|---|---|---|---|---|
| PHASE I | | | | | |
| | ED240a | 12 | Written | 102 | 8.50 |
| | ED240b | 11 | Written | 135 | 12.27 |
| | ED440 (Fall) | 6 | Written | 179 | 29.83 |
| | ED440 (Spring) | 8 | Written | 450 | 56.25 |
| | Sub-total | 37 | Written | 866 | 23.41 |
| | ED240a | 14 | Tape | 100 | 7.14 |
| | ED240b | 13 | Tape | 205 | 15.77 |
| | ED440 (Fall) | 7 | Tape | 187 | 26.71 |
| | ED440 (Spring) | 9 | Tape | 381 | 42.33 |
| | Sub-total | 43 | | 873 | 20.30 |
| PHASE II | | | | | |
| | ED440 (Fall) | 9* | Written | 178 | 19.78 |
| | | 9* | Tape | 185 | 20.56 |

* repeated measures - same group - crossover design

Phase II

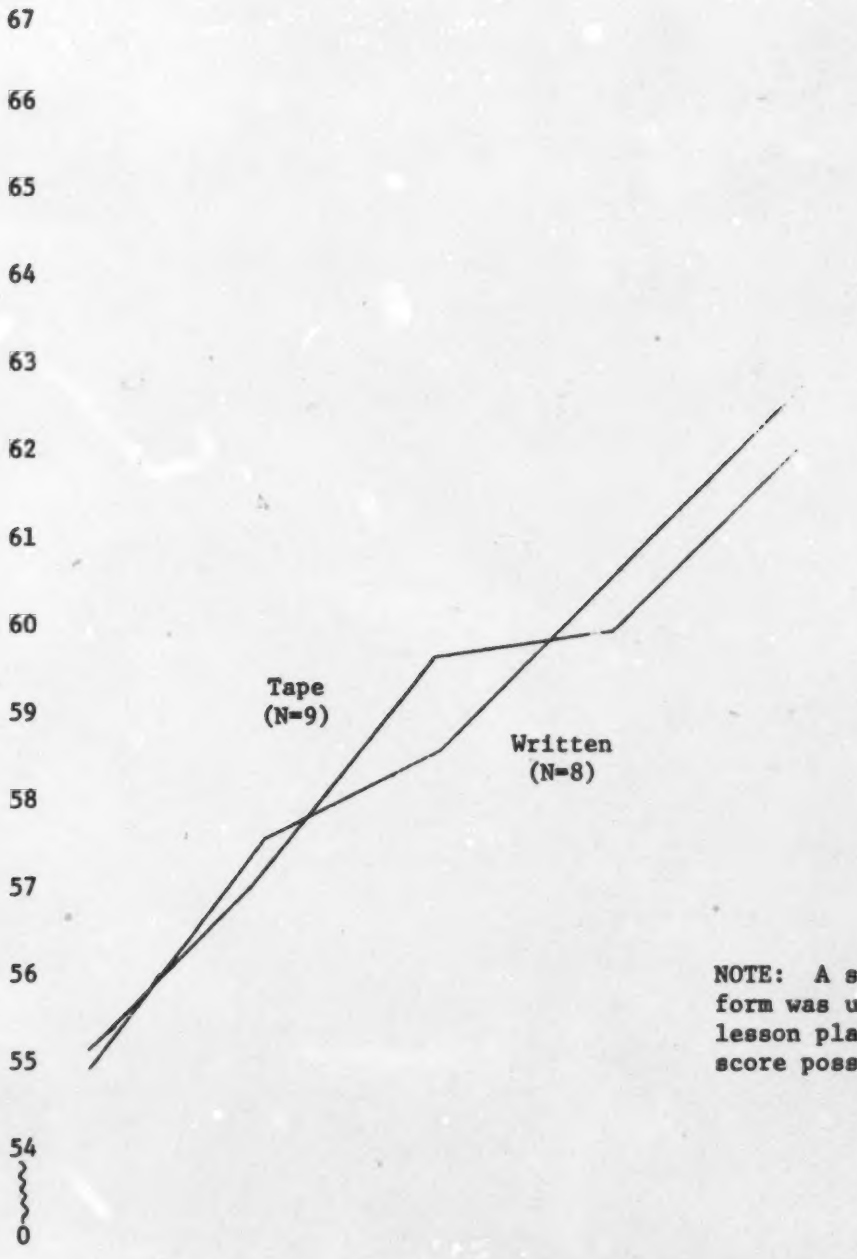
The second phase of the study is presently in progress. The objectives are the same but a different research design is being used. A counterbalanced (Campbell and Stanley, Number 11) design is being used. With this design all students experience both written and taped feedback. This should provide a better basis for evaluating the feedback modes. Only one class, Ed 440, with nine students has complete data for Phase II. The limited data tends to support Phase I findings. (See Tables 1 and 2)

Figure 2

Mean Score on Assignments

Spring 1977

Education 440




NOTE: A standard grading form was used to grade the lesson plans. The highest score possible was 67.

## Discussion

In light of Phase I findings, it appears providing students with individualized feedback via audio cassette tapes is a viable procedure, especially in upper level classes. A savings of faculty time was realized by using tape recorded feedback. This was more apparent in the upper level classes. Using tape recorded feedback instead of written feedback would save some faculty time which could be used for professional or personal activities.

In this study there was no difference between written feedback and tape recorded feedback in improving student performance. It appears that either method is as good as the other in improving student performance. The important point that should be made is that there was a tendency for both types of individualized instructional feedback to help students improve. A clue which may offer insight into why this happened is found in item 2 on the attitude assessment instrument. Students in Phase I indicated they would like more feedback similar to the type they were receiving in other classes. This indicates students may not be receiving personalized feedback in their other classes. Therefore, any type of individualized feedback would be beneficial to the student.

Students had a more positive attitude toward tape recorded feedback than written feedback. Some educators believe students will perform better in a class if their attitudes are favorable toward the class. If this is true then individualized tape recorded feedback should be helpful in developing positive attitudes. It certainly doesn't hurt to have students like part of a class.

Providing students with individualized instructional feedback via cassette tape should be considered by more professors. The students like it, faculty time is saved, and most importantly--students learn.

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